

Serial No.: 10/814,445
Reply to Office action of November 1, 2005

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REMARKS

Applicant respectfully submits that this response and amendment complies with 37 CFR § 1.113, and requests entry of this Amendment After Final and reconsideration of the pending claims. Claims 29-31 and 33-35 are amended and claim 13 is cancelled for the purpose of putting the application in condition for allowance, or in the alternative, in better form for appeal. A Notice of Appeal is filed herewith. Accordingly, claims 1-12, 15, and 27-40 are pending.

Claims 1-13, 15 and 27-40 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

With respect to claims 1, 31, 39 and 40, the claims were rejected by the present Office Action on the basis that there did not appear to be a written description requirement of dissipation factors less than 0.01 or 0.001 at a specified frequency of 10kHz in the application. Applicant respectfully points to the description of dissipation factors at a specific frequency of 10kHz provided in Table 1, page 18 of the specification, and requests that the rejection be withdrawn.

With respect to claims 15 and 32, the claims were rejected by the present Office Action on the basis that there is no support in the specification for a specific endpoint of less than 1 micron. Applicant respectfully traverses the rejection of the claims on the grounds that the Applicant is entitled to the full scope of the invention including the subranges therein and is thus entitled to a low range upto the point where it has been disclosed in the prior art. As mentioned in the Office Action, an average particle size in the range from about 0.01 microns to about 25 microns is described in paragraph 22 of the specification. The specification also provides example of compositions having a particle size of less than 1 micron, specifically 0.4 microns (paragraph 48, Example 2 and paragraph 49, Example 3). However, to advance prosecution and secure a notice of allowance, Applicant would be willing to amend claims 15 and 32 to a particle size in a range of about 0.01 microns to about 0.4 microns if this would secure allowable subject matter. The lower range limit is specifically called out, and the upper range limit is shown by Example. Otherwise, for at least the reasons cited above, the Applicant maintains that logical subdivisions of the explicitly stated average particle size ranges can be made and the Applicant is entitled to an average particle size in a range from about 0.01 microns to less than 1 micron.

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With respect to claim 33, the claim has been amended as suggested by the Office Action to recite a maximum particle size in a range of from about 0.01 microns to about 0.254 microns.

With respect to claims 29 and 30, the claims have been amended as suggested by the Office Action to recite a bondline thickness in a range from 0.254 microns to 127 microns and a bondline thickness in a range from 0.254 microns to 50.8 microns respectively. The term "about" has been removed as suggested.

With respect to claim 34, the claim has been amended as suggested by the Office Action to recite a bond line thickness in a range of from about 1 times to about 10 times the maximum particle size.

With respect to claim 35, the claim has been amended and the term "about" has been removed as suggested.

Claims 29, 30, 34 and 35 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite. The claims are amended to define that "the composition is capable of forming a film that has a bondline thickness".

Therefore, Applicant respectfully submits that claims 1-13, 15 and 27-40, particularly as amended and for at least the reasons cited above, comply with the requirements of 35 U.S.C. § 112, first and second paragraphs. Withdrawal of the rejection of claims 1-13, 15 and 27-40 under 35 U.S.C. § 112 is respectfully requested. Or, in the alternative, entry of this Amendment is requested for purposes of putting the application in better form for purposes of appeal.

Claims 1, 2, 4-7, 9-12 and 27 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application No. US 2003/0027910 (hereinafter "Misra '910"). Applicant respectfully traverses the rejection of claims 1, 2, 4-7, 9-12 and 27 under 35 U.S.C. § 102(b) over the cited reference for the reasons listed below.

With reference to the discussion set forth in paragraph 6 of the office action mailed on 6/1/2005, Applicant maintains that the subject matter is patentable for the reasons set forth in page 6 of the reply to the above-mentioned Office Action, mailed on 8/22/2005.

The invention as defined in independent claim 1 and its dependent claims has "a relatively lower amount of liquid metal" when compared to Misra '910, as admitted in the present Office Action. Misra '910 does not teach a thermal conductive composition

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having such low amounts of liquid metal. Applicant agrees that a material and its properties are inseparable, and would add that differing compositions or combinations of materials would have correspondingly different properties. Applicant submits that "a relatively lower amount of liquid metal" in the claimed invention may result in a property that differs from the property of Misra '910, which has an admittedly different amount of liquid metal. Specifically, a difference may be a dissipation factor of less than about 0.01 at about 10kHz when the material is cured. Applicant agrees that the property of a material is inherent to the material; and, because of this inherency the Applicant maintains that "a relatively lower amount of liquid metal" in the claimed invention results in a difference in property (for example, dissipation factor) inherent to the amount of material present.

There is another distinction between the cited art and the claimed invention. Misra '910 does not teach a thermal conductive composition that has a dissipation factor less than about 0.01 *when cured*. That is, Misra '910 does not teach a curable resin, and discloses a polymer matrix made up of paraffin, microwax or silicone waxes. See paragraph 41, column 4. The composition of Misra '910 does not cure. This is particularly salient because Misra '910 does not envisage a thermally conductive composition having a dissipation factor of less than about 0.01 at 10kHz *when cured*.

Applicant respectfully declines to argue criticality in that the applicant is merely noting that the dissipation factor of the composition when cured is a patentable distinction from the material disclosed in Misra '910.

Under 35 U.S.C. § 103(a), claims 1, 2, 4-7, 9-12 and 27 were rejected as being obvious over Misra '910; and claims 1-13 and 27 were rejected as being unpatentable over U.S. Patent Application No. US 2003/0187116 (hereinafter "Misra '116"). With reference to the discussion set forth in paragraph 7 of the office action mailed on 6/1/2005, the applicant maintains that the subject matter is patentable for the reason set forth in pages 6 and 7 of the reply to the above-mentioned Office Action, mailed on 8/22/2005.

Despite the assertions submitted in the present office action, Applicant respectfully traverses the rejection over the cited references for at least the reasons stated above with respect to claims 1, 2, 4-7, 9-12 and 27 and for the reasons listed below.

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Neither Misra '910 nor Misra '116 render the claimed invention obvious. Generally, Applicant notes that neither Misra '910 nor Misra '116 teaches a thermally conductive composition with "relatively lower amount of liquid metal" as noted in the Office Action. With reference to independent claim 1, neither Misra '910 nor Misra '116 teaches a thermal conductive composition having a dissipation factor as claimed, *when cured*. Additionally, neither Misra'910 nor Misra'116 show any motivation to modify the amounts of liquid metal to obtain the dissipation factor as claimed. For a *prima facie* case of obviousness, all of the claim elements must be disclosed, suggested or taught in the references, or in the combination of references, and there must be a motivation to modify or combine. Here, the elements are neither disclosed nor even hinted at and no reason is provided as to why one of ordinary skill would be motivated to make the suggested modifications and/or combinations.

Claims 15 and 27-40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Misra '116 in view of U.S. Patent No. 4,942,190 (hereinafter "Murayama et al."). With reference to the discussion set forth in paragraph 7 of the office action mailed on 6/1/2005, Applicant maintains that the subject matter is patentable for the reasons set forth in pages 6 and 7 of the reply to the above-mentioned Office Action, mailed on 8/22/2005.

Despite the assertions submitted in the present office action, Applicant respectfully traverses the rejection over the cited references for at least the reasons stated below with respect to independent claims 15 and 32 and their dependent claims.

Applicant notes that neither Misra '116 nor Murayama et al. teaches a thermally conductive composition having a particulate filler having an average particle size in a range from about 0.01 microns to less than 1 micron, as recited in independent claims 15 and 32. For a *prima facie* case of obviousness, all of the claim elements must be disclosed, suggested or taught in the references, or in the combination of references. Accordingly, neither Misra '116 nor Murayama et al., or the combination, provide a *prima facie* case of obviousness.

Additionally, one of ordinary skill in the art would not be motivated to modify or combine the teachings of Misra '116 with those of Murayama et al. One material is curable, while the other material is not. Each uses an entirely different cure chemistry and cure mechanism. Misra'116 teaches a thermally conductive pad having a hot wax or

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melt resin, a thermally conductive particulate, and a liquid metal. Murayama et al. teaches an insulating resin paste having a thermosetting epoxy paste and particulate filler. Accordingly, there is no obvious way to combine the technology of a thermally conductive pad of Misra' 116 with that of an insulating paste of Murayama et al.

Even if teachings of the Misra' 116 and Murayama et al. were somehow combined, no combination of the cited references teaches or suggests the Applicant's claimed invention of a composition having liquid metal, silicone resin and a particulate filler having a particle size in the range of from about 0.01 microns to about 1 micron, as recited in claims 15 and 32. It is unclear whether the combination proposed in the Office Action (wax + epoxy) would be even theoretically possible, let alone would provide one of ordinary skill in the art with a reasonable expectation of success. A *prima facie* case of obviousness has not been made.

Consequently, independent claims 1, 15, 32 and their dependent claims are believed to be in condition for allowance for at least the reasons summarized above. Applicant respectfully requests withdrawal of the final rejection and a notice of allowance. In the alternative, Applicant requests that this Amendment be entered for purposes of filing the Appeal. As noted above, a Notice of Appeal is filed herewith.

Should the Examiner believe that anything further is needed to place the application in condition for allowance, the Examiner is invited to contact the Applicant's undersigned representative at the telephone number below. Any additional fees for the accompanying response are hereby petitioned for, and the Director is authorized to charge such fees as may be required to Deposit Account 07-0868.

Respectfully submitted,



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